REMARKS

Claims 1-20 are now in the application. No claims have been amended by this Response. Claim 11 has been withdrawn by the Examiner. No new matter has been added.

Claims 1-10 and 12-20 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,977,126 to Mauldin et al. in view of U.S. Patent No. 6,274,763 to Ruedinger et al.

Prior to addressing the rejection in the Office Action, Applicants provide a brief overview over the particular advantages that the claimed process for producing a catalyst for catalytic gas-phase oxidations of aromatic hydrocarbons to carboxylic acids and/or carboxylic anhydrides provides. In particular, as noted at page 2, lines 17-21, the claimed subject matter allows to scale-up the operating parameters of laboratory or pilot plant scale to production scale without the costly empirical trials that have been carried out in the related art.

Applicants respectfully submit that the applied citations to Mauldin and Ruedinger fail to provide any guidance on how to scale-up the catalyst production processes suggested therein.

At page 6, third full paragraph, the Office Action points out, with regard to the claim recitation "for catalytic gas-phase oxidations of aromatic hydrocarbons," that claim 1 recites a process for producing a catalyst. At page 8, lines 2-4, the Office Action asserts that a catalyst can be used in any chemical reaction unless something very specific about the chemical composition prohibits the application in an alternative gas phase reaction.

Applicants respectfully submit that a skilled artisan must have some articulate reason as to why a particular feature of an applied citation would be combined with another citation. An assertion that nothing prohibits the use of a catalyst in an alternative reaction is insufficient because it does not guide the skilled artisan towards a specific approach compared to all other approaches that are likewise not prohibited.

At page 8, lines 5-8, the Office Action asserts that the pending claims are drawn to a process for producing a catalyst and not for a particular composition of a catalyst. Applicants respectfully submit that claim 1 recites, among other features, fluidizing the inert support by introduction of a gas stream heated to a temperature of T_{gas} at a flow rate of Q_{gas}. Ruedinger is not concerned with a fluidized bed apparatus. Instead, Ruedinger suggests, at col. 3, lines 64-67, coating the catalyst support in a rotary tube furnace or by drum coating.

Claim 1 recites, among other features, a parameter K defined as

$$K = 0.020\ Q_{gas} - 0.055\ Q_{susp} + 7.500\ B_{susp} - 0.667\ M_{support} + 2.069\ T_{gas} - 7$$

satisfies the relationship $127.5 \leq K \leq 202$.

At least this feature of the independent claim cannot reasonably be considered to be suggested in Mauldin, Ruedinger, or any permissible combination thereof.

As noted above, by selecting the processing parameters in the claimed process for producing a catalyst for catalytic gas-phase oxidations of aromatic hydrocarbons to carboxylic acids and/or carboxylic anhydrides such that the relationship $127.5 \leq K \leq 202$ is satisfied, production scale catalysts can be produced from the laboratory or pilot plant scale without costly empirical testing.

The claimed method is not suggested in the applied citations, nor would a skilled artisan be guided on how to scale-up the processes suggested therein.

At page 8, the Office Action provides a table comparing the claimed ranges to ranges of process variables suggested in the applied citations. Right below that table, the Office Action asserts that a chemical process can run on a few kilogram of material as well as hundreds or thousands of kilograms of material with appropriate scale up factors. However, the Office Action does not indicate how the appropriate scale up factors are obtained. Applicants respectfully submit that the Office is not tasked with picking and choosing values in the related art such that

the above relationship for K is satisfied. Instead, the Office is tasked with demonstrating where and why a skilled artisan would be apprised by the applied citations of the appropriate scale up factors to arrive at a process in which the above relationship for K is satisfied. This burden has not been met in the Office Action.

For example, the Office Action states, at the bottom of page 8, if the mass is increased from the 0.4 to 22 kg suggested in Mauldin to the claimed range of 60-240 kg, all other parameters would be normalized to "meet the mass value of the reaction." This assertion is incorrect

If, for example, catalyst preparation 1 is considered, Mauldin suggests 1.0 kg of support, which is fluidized at a flow rate of 56 CFM, which corresponds to approximately 95.1 m^3/hour. According to the Office Action, if a skilled artisan were to scale-up this process to, for example 240 kg of support, the appropriate scale factor is 240, which results in a flow rate of approximately 22,824 m^3/hour, which is outside the claimed range. Similarly, using catalyst preparation 3 as an example, Mauldin suggests 15.0 kg of support, which is fluidized at a flow rate of 150 CFM, which corresponds to approximately 245.8 m^3/hour. According to the Office Action, if a skilled artisan were to scale-up this process to, for example 60 kg of support, the appropriate scale factor is 4, which results in a flow rate of approximately 1,019.4 m^3/hour, which is also outside the claimed range. Thus, at least some parameters, if normalized do not "meet the mass value of the reaction."

There are, however, other scale factors that could be extracted from Mauldin that would provide a flow rate within the claimed range. Nevertheless, Mauldin does not guide a skilled artisan to scale up the processes therein to arrive at the claimed subject matter.

In particular, Applicants respectfully disagree with the assertion at page 8, third line from the bottom, that B_{susp} and T_{gas} are absolute parameters. At the onset, Mauldin, which is not directed at a catalyst for catalytic gas-phase oxidations of aromatic hydrocarbons to carboxylic acids and/or carboxylic anhydrides, fails to suggest a binder composition. Thus, Mauldin fails to suggest that the amount of binder in the suspension is a result-effective variable.

Moreover, the amount of binder B_{susp} is included in the calculation of K. It is not an absolute value that necessarily has to be maintained when scaling up a process. For example, according to claim 1, if the amount of support $M_{support}$ is doubled from 60 kg to 120 kg, the term $-0.667 * M_{support}$ decreases from -40.02 to -80.04. Thus, an increase in binder from 2 to approximately 7.336% by weight results in an unchanged value of K because the difference between 7.5 (7.336-2) equals the difference between -.667(120-60).

The Office Action fails to provide support for the assertion that Ruedinger suggests that the amount of binder is an absolute parameter. However, if such a suggestion can indeed be found in Ruedinger it would teach away from the claimed subject matter because such a suggestion fails to apprise a skilled artisan on how to scale up a catalyst by simply increasing the amount of binder.

Similarly, Applicants disagree with the assertion in the Office Action that the temperature is an absolute variable. However, a comparison between inventive example 1 and comparative example 2 at pages 7 and 8 of the specification demonstrates that, all other parameters being equal, choosing a temperature such that K is below the claimed range results in production of catalysts having many twin rings due to insufficient drying.

At page 9, second full paragraph, the Office Action assert that "[d]rying depends upon the total mass, obtained by normalizing the prior art as indicated above for a given length of time. 'K' values does not have time as a parameter."

Applicants demonstrated, at page 8, lines 31-34, that if the temperature is selected too low, such that K does not satisfy the relationship $127.5 \leq K \leq 202$, twin rings are formed which is a result from insufficient drying. Accordingly, it is one advantage of the claimed process that process parameters can be found that avoid the formation of twin rings. This is but one of the many examples provided in Applicants' disclosure why one cannot simply pick and choose values for process parameters in a scaled-up process by using "appropriate scale up factors."

Claims 2-10 and 11-20 are in condition for allowance for at least their respective dependence on an allowable claim 1, as well as for the separately patentable subject matter that each of these claims recites.

In view of the above, Applicants believe the pending application is in condition for allowance.

Applicants concurrently herewith submit the requisite fee for a Petition for a three-month Extension of Time. Applicants believe no additional fee is due with this response. However, if any such additional fee is due, please charge our Deposit Account No. 22-0185, under Order No. 13111-00037-US1 from which the undersigned is authorized to draw.

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Respectfully submitted,

Electronic signature: /Georg M. Hasselmann/
Georg M. Hasselmann
Registration No.: 62,324
CONNOLLY BOVE LODGE & HUTZ LLP
1875 Eye Street, NW
Suite 1100
Washington, DC 20006
(202) 331-7111
(202) 293-6229 (Fax)
Attorney for Applicant